

Station 2143, March 23, 1884; Gulf of Darien; north latitude $9^{\circ} 30' 45''$, west longitude $76^{\circ} 25' 30''$; 155 fathoms, green mud. One female (6939).

NEW HAVEN, CONN., April 29, 1885.

ON SOME GENERA AND SPECIES OF PENÆIDÆ, MOSTLY FROM RECENT DREDGINGS OF THE UNITED STATES FISH COMMISSION.

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Penæus Fabricius (restricted).

Unfortunately I have not been able to examine either of the species referred to the genus by Fabricius, but in *P. carimonte*, *canaliculatus*, *Brasiliensis*, *semisulcatus*, *setiferus*, and *stylirostris* the antennular flagella are very short; the distal segment of the mandibular palpus is much larger than the proximal, very broad, and not prolonged into a narrow tip; the endognath of the first maxilla is greatly elongated and segmented; the endopod of the maxilliped is slender and composed of four segments, and the exopod is lamellar and unsegmented; both pairs of gnathopods have well-developed epipods and large exopods; all the pereopods have small exopods, but only the first, second, and third are furnished with epipods; there is a well-developed pleurobranchia on the fourteenth somite. The number and arrangement of the branchiæ and epipods are the same for all these species, and is indicated in the following formula:

Somites.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	Total.
Epipods.....	1	1	1	1	1	1	0	0	(6)
Podobranchiæ.....	0	1	0	0	0	0	0	0	1
Arthrobranchiæ.....	r.	2	2	2	2	2	1	0	11 + r.
Pleurobranchiæ.....	0	0	1	1	1	1	1	1	6
									18 + r. + (6)

These species also agree in having well-developed antennal and hepatic spines and conspicuous antennal and hepatic sulci; but these characters are not regarded as of generic value.

Parapenæus, gen. nov.

The species referred to the genus here proposed are at once distinguished from the species of *Penæus* proper in having the endognath of the first maxilla short and unsegmented, the second gnathopod without an epipod, and the fourteenth somite (posterior somite of the peræon) wholly without branchiæ. The species examined further agree in having none of the sulci of the carapax conspicuous except the cervical, and in having the antennular flagella shorter than the carapax. In the first three species here referred to the genus the mandibular palpi

are as in the typical species of *Penæus*, there are no exopods at the bases of any of the peræopods, and the branchio-epipodal formula is—

Somites.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	Total.
Epipods.....	1	1	0	1	1	1	0	0	(5)
Podobranchiæ.....	0	1	0	0	0	0	0	0	1
Arthrobranchiæ.....	r.	2	2	2	2	2	1	0	11 + r.
Pleurobranchiæ.....	0	0	1	1	1	1	1	0	5
									17 + r. + (5)

In *P. constrictus* and a Japanese species here doubtfully referred to the *P. barbatus* (De Haan) the distal segment of the mandibular palpus is slightly elongated and narrowed distally; there are very small narrow lamellar exopods at the bases of all the peræopods; and there is no pleurobranchia on the thirteenth somite, the branchio-epipodal formula being—

Somites.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	Total.
Epipods.....	1	1	0	1	1	1	0	0	(5)
Podobranchiæ.....	0	1	0	0	0	0	0	0	1
Arthrobranchiæ.....	0	2	2	2	2	2	1	0	11
Pleurobranchiæ.....	0	0	1	1	1	1	0	0	4
									16 + (5)

These characters might be considered of generic value, but I prefer not to propose a new genus for these two species, and I am confirmed in this from the examination of two other species: a Japanese species (possibly the *P. affinis* (M.-Edwards), but evidently not the species figured by Bate as the male of that species) which closely resembles the *constrictus* and *barbatus* in general appearance, but has no exopods at the bases of the posterior peræopods and has the epipods and branchiæ as in *P. longirostris*; and *P. Goodei*, described beyond, which, though resembling the *constrictus* and *barbatus* in external characters, has the mandibular palpi, epipods, and branchiæ as in *P. longirostris*, and long and slender exopods at the bases of all the peræopods.

Parapenæus longirostris.

Penæus longirostris Lucas, Explor. Algérie, Crust., p. 46, pl. 4, fig. 6, 1849.

Penæus membranaceus Heller, Sitzungsber. Akad. Wiss. Wien, xlv, p. 423, pl. 2, fig. 49, 1862; Crust. südlichen Europa, p. 296, pl. 10, fig. 11, 1863.

Penæus Bocagei Johnson, Proc. Zool. Soc. London, 1863, p. 255; *ibid.*, 1867, p. 900 (< *longirostris*).

I take this Mediterranean species, of which I have examined a specimen received from the Rev. A. M. Norman, as the type of the genus.

Judging from his description, this is apparently not Risso's *Penæus membranaceus* (Crust. de Nice, p. 98, 1816), which is probably indeterminate. He describes the rostrum as short, and again as "un petit rostre aplati et denté," which would apply better to the Mediterranean

Solenocera, but the length given would indicate a very much larger species than the *Solenocera*. It is perhaps best to drop the name *membranaceus* entirely, or at least until it can be shown with some degree of certainty to what species it really applies.

Parapenæus politus.

Penæus politus Smith, Proc. National Mus., iii, p. 444, 1881.

Several specimens, agreeing well with the single one originally described, were taken in 1881 by the Fish Hawk, off Martha's Vineyard, in 79 to 128 fathoms, and in February, 1884, a large number were taken by the Albatross, in 31 to 34 fathoms, in the Gulf of Paria.

The species is closely allied to *P. longirostris*, and some of the specimens from the Gulf of Paria have the rostrum much longer than any of the northern specimens and approach the Mediterranean species so closely that it is quite possible that a large series of specimens might show that the *politus* is only a variety of *P. longirostris*. All the specimens seen, however, are easily distinguished from the *longirostris* by the shorter rostrum, which falls much short of the tips of the antennal scales, and by the somewhat smaller eyes.

Parapenæus megalops, sp. nov.

This species is closely allied to *P. longirostris* and *politus*, but is at once distinguished from them by the broader carapax, the more numerous teeth upon the rostrum, the very much larger eyes, and by the branchiostegial spine being on, instead of a little way back from, the anterior margin of the carapax.

The surface of the carapax and pleon is naked and smooth. The carapax is about as broad as high and very little compressed anteriorly. The antennal, hepatic, and branchiostegial spines are well developed, the latter forming the antero-inferior angle of the carapax. From the hepatic spine a sharp elevation extends backward and upward, marking the posterior margin of the cervical suture, but fades out before reaching the dorsum, which is evenly rounded posteriorly but rises in front in a carina armed with a single spine in the middle of the gastric region far back from the crowded teeth of the rostrum proper, only one or two of the most posterior of which are back of the orbit. The rostrum is a little shorter than the carapax proper, reaches to the tips of the antennal scales in all of the females seen, but falls short of them in the males, is nearly horizontal or considerably arched upward in the middle, is rapidly narrowed vertically from the base to about the middle of the eyes, beyond which it is slender and gradually tapered to an acute tip, and the dorsal edge is armed with twelve to fifteen spiniform teeth which are crowded posteriorly but become gradually more and more remote and smaller toward the tip, to which they very nearly reach.

The eyes are black, reniform, flattened above, and very large, apparently slightly larger in the males than in the females; the greatest

diameter being nearly half the length of the antennal scale, and from a third to fully two-fifths of the length of the carapax excluding the rostrum.

The proximal segment of the peduncle of the antennula is about half as long as the antennal scale, very broad, lamellar, slightly concave above to fit the eye, and the outer margin armed with a small tooth near the base and with a slender spine at the anterior angle; the second segment is scarcely a third as long as the proximal and nearly as broad as long; and the distal segment is fully as long as the second, slender and subcylindrical. The antennular flagella are slender, the inner approximately as long as the antennal scale, the outer slightly shorter. The antennal scale is considerably broader at base and more tapered distally than in *P. longirostris*, but otherwise the antennæ are nearly as in that species.

The peræopods are very similar to those of *P. longirostris*, but are all somewhat longer and apparently stouter; the second pair reach nearly to the second segment of the peduncle of the antennula, and the third and fifth to or a little by the tips of the antennal scales.

The anterior somites of the pleon are nearly as in *P. longirostris*, but the dorsal carina on the third, fourth, and fifth is not quite as thin and does not project in so distinct teeth at the posterior margins of the somites, and the pleura of the fifth somite project slightly more posteriorly.

The telson is a little longer than the sixth somite, conspicuously sulcated above, the margins of the sulcus carinated and terminating in a long spiniform process either side and a little way from the slender and acute tip. Below the dorsal carina there is an inconspicuous lateral carina either side joining the dorsal a little way from the base of the lateral process, in front of which there are two aculei on the edge itself. The inner lamella of the uropod reaches to about the tip of the telson, is ovate-lanceolate and between three and four times as long as broad. The outer lamella is considerably longer than the telson, about a fourth as broad as long, with the outer margin terminating, about two-thirds of the way from the base to the tip, in a small spine, beyond which the lamella is suddenly narrowed but the tip itself rounded.

The peculiar sexual appendage of the first pleopod is an elongated, approximately rectangular plate longitudinally plicated, and joining its fellow of the opposite side for nearly the whole length of the mesial edge.

Measurements in millimeters.

Catalogue number.....	7263	7262
Station	2143	2125
Sex	♂	♀
Length from tip of rostrum to tip of telson.....	105	140
Length of carapax including rostrum.....	36.5	54
Length of rostrum.....	16.5	25
Height of carapax.....	11.5	18
Breadth of carapax.....	11.5	17
Length of eye-stalk and eye.....	10.0	12
Greatest diameter of eye.....	8.5	10
Length of antennal scale.....	19.0	24
Breadth of antennal scale.....	5.0	7.7
Length of second gnathopod.....	30	45
Length of first peraeopod.....	24	32
Length of carpus.....	4.8	6.5
Length of chela.....	5.8	8.0
Breadth of chela.....	1.3	1.9
Length of dactylus.....	3.7	4.7
Length of second peraeopod.....	31	44
Length of carpus.....	10.0	14
Length of chela.....	5.4	7.0
Breadth of chela.....	1.2	1.7
Length of dactylus.....	3.0	4.0
Length of third peraeopod.....	40	55
Length of merus.....	12	15
Length of carpus.....	16	22
Length of chela.....	6	8
Breadth of chela.....	1.0	1.4
Length of dactylus.....	3.0	3.9
Length of fourth peraeopod.....	45	45
Length of merus.....	14	14
Length of carpus.....	11	11
Length of propodus.....	6	6
Length of dactylus.....	4	4
Length of fifth peraeopod.....	42	55
Length of merus.....	15	18
Length of carpus.....	14	17
Length of propodus.....	5.5	7.5
Length of dactylus.....	3.2	4.0
Length of sixth somite of pereon.....	15	20
Height of sixth somite of pereon.....	8	11
Length of telson.....	17.5	22
Length of inner lamella of uropod.....	14.0	18.0
Breadth of inner lamella of uropod.....	4.0	5.0
Length of outer lamella of uropod.....	19.0	25.0
Breadth of outer lamella of uropod.....	4.8	6.1

This species was taken in 1884, at two stations in the Caribbean Sea, by the Albatross: Station 2125, February 18, south of Curaçoa, north latitude $11^{\circ} 43'$, west longitude $69^{\circ} 9' 30''$, 208 fathoms, yellow mud and sand, temperature $50^{\circ}.7$, two females; and station 2143, March 23, Gulf of Darien, north latitude $9^{\circ} 30' 45''$, west longitude $76^{\circ} 25' 30''$, 155 fathoms, green mud.

Parapenæus constrictus.

Penæus constrictus Stimpson, Ann. Lyc. Nat. Hist. New York, x, p. 135, 1871.

Numerous specimens were taken in 1881 by the Fish Hawk, off Chesapeake Bay, in 18 fathoms, and in 1884 by the Albatross, off Cape Hatteras, in 7 to 27 fathoms. I have also examined specimens from Fort Macon, North Carolina, and from Bermuda.

All these specimens agree well with Stimpson's description except that the carina of the carapax is scarcely grooved longitudinally, though distinctly flattened, at the cervical suture. The dorsal crest of the rostrum proper is armed with seven to nine equidistant teeth, and back of these, on the carina of the gastric region, there is a small tooth, de-

scribed by Stimpson as the gastric tooth, and not referred to in connection with the rostral teeth, which explains the apparent discrepancy pointed out by Miers (Proc. Zool. Soc. London, 1878, p. 304) between Stimpson's description and the specimen in the British Museum. The surface of the posterior part of the branchial regions of the carapax and of the whole of the pleon, except a very narrow and inconspicuous line of pubescence either side of the dorsal carina of the fifth and sixth somites, is entirely naked and glabrous. The dorsal carina of the fourth and fifth somites of the pleon is divided by a narrow incision like that in *P. Goodei*, but not quite as deep. The telson is shorter than the sixth somite and rather suddenly tapered to a short acuminate tip armed either side with a short and very small spine.

Variety *similis*.

There are four specimens, one male and three females, taken by the Albatross, station 2121, February, 1884, Gulf of Paria, north latitude $10^{\circ} 37' 40''$, west longitude $61^{\circ} 42' 40''$, 31 fathoms, which appear to represent a distinct species very closely allied to *P. constrictus*, but as a large series of specimens from the West Indies would very likely show them to be only a variety, I describe them here as such.

These specimens are a little larger than the largest observed specimens of *constrictus*, and the rostrum somewhat longer, more slender, and armed with eight or nine teeth in addition to the one on the gastric region. The whole surface of the carapax and of the fourth, fifth, and sixth somites of the pleon is thickly covered with very short and stiff setæ, like those on the anterior portion of the carapax of *P. constrictus*, and the surface itself, after the removal of the setæ, is thickly punctate. The telson is considerably longer than the sixth somite of the pleon, and tapers very gradually to a very long and slender tip armed either side its base with a long and very slender spine.

Measurements of two of these specimens and of two of the largest observed specimens of the typical *constrictus* are given in the accompanying table:

Measurements in millimeters.

	<i>P. constrictus.</i>		Var. <i>similis</i> .	
Catalogue number.....	901	8870	7265	7265
Station.....		2285	2121	2121
Sex.....	♂	♀	♂	♀
Length from tip of rostrum to tip of telson.....	51	65	62	80
Length of carapax including rostrum.....	18.5	26.5	22.7	31.0
Length of rostrum.....	7.2	10.0	9.0	13.3
Height of carapax.....	7.0	9.6	8.0	11.7
Breadth of carapax.....	6.0	9.0	7.5	10.1
Length of eye-stalk and eye.....	4.3	6.0	5.2	7.0
Greatest diameter of eye.....	3.0	4.1	4.5	5.2
Length of antennal scale.....	8.8	11.3	11.0	13.4
Breadth of antennal scale.....	3.2	4.0	3.6	4.8
Length of first pereopod.....	9.5	15.0	12.5	18.0
Length of merus.....	2.4	3.6		
Length of carpus.....	2.3	3.2	3.0	
Length of chela.....	2.1	3.3	3.0	4.1

Measurements in millimeters—Continued.

	<i>P. constrictus.</i>		Var. <i>similis.</i>	
Breadth of chela.....	0.75	1.3	0.8	1.1
Length of dactylus.....	1.4	2.2	1.9	2.5
Length of second peræopod.....	13.0	19.5	17.5	25.0
Length of carpus.....	4.2	6.5	6.0	8.4
Length of chela.....	2.3	3.7	3.2	4.5
Breadth of chela.....	0.65	0.95	0.7	0.85
Length of dactylus.....	1.4	2.2	1.9	2.7
Length of third peræopod.....	17.5	27.0	24	36
Length of merus.....	4.5	7.0	6.4	10.0
Length of carpus.....	6.2	10.0	9.5	14.5
Length of chela.....	2.7	4.4	4.0	5.8
Breadth of chela.....	0.6	0.9	0.65	0.8
Length of dactylus.....	1.5	2.3	2.1	3.0
Length of fourth peræopod.....	15.0	21.5	20	28
Length of merus.....	3.7	5.3	4.9	7.7
Length of carpus.....	3.5	5.2	5.0	7.4
Length of propodus.....	2.3	3.5	3.3	4.8
Length of dactylus.....	1.6	3.0	2.2	3.0
Length of fifth peræopod.....	19.5	27.5	26	37
Length of merus.....	5.0	7.8	7.6	11.5
Length of carpus.....	4.9	7.5	7.5	11.0
Length of propodus.....	3.1	4.6	4.4	6.3
Length of dactylus.....	1.8	2.6	2.6	3.6
Length of sixth somite of pereon.....	6.7	8.2	8.0	10.0
Height of sixth somite of pereon.....	5.0	6.2	5.6	7.5
Length of telson.....	6.3	8.0	9.2	12.0
Length of inner lamella of uropod.....	6.4	8.4	8.0	9.7
Breadth of inner lamella of uropod.....	1.9	2.4	2.2	3.0
Length of outer lamella of uropod.....	7.5	9.6	9.0	10.8
Breadth of outer lamella of uropod.....	2.4	3.3	2.8	3.8

Parapenæus barbatus (De Haan sp.).

De Haan's species is evidently distinct from the *affinis* to which he referred it, and is apparently closely allied to *P. constrictus*. I have examined specimens from the Bay of Jeddo, Japan, which agree perfectly with De Haan's figure of *P. barbatus* and with his description, except that there is no branchiostegial spine, although the margin of the carapax projects forward in a slightly prominent angle beneath the base of the antenna. These specimens resemble *P. constrictus* closely, and agree with it perfectly in the oral appendages, the number and arrangement of the branchiæ, epipods, and exopods, and in the appendages of the first pleopods of the male, but differ in having nearly the whole surface of the carapax and pleon pubescent.

Parapenæus anchoralis (Bate sp.) is apparently closely allied to *P. constrictus*, and should undoubtedly be referred here, as should also, apparently, *P. affinis* (M.-Edwards sp.), *P. monoceros* (Fabricius sp.), and *P. velutinus* (Dana sp.). Several other of the described Pacific Ocean species probably belong to the genus, but it is impossible to determine their affinities from the published descriptions and figures.

Parapenæus Goodei, sp. nov.

This species resembles *P. constrictus*, and is apparently very closely allied to *P. velutinus* (Dana sp.), which is described as having the second and third peræopods subequal and the telson armed with minute spinules, and is figured as having the fourth peræopods fully as long as the fifth;